

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
15 April 2004 (15.04.2004)

PCT

(10) International Publication Number
WO 2004/030463 A1

- (51) International Patent Classification⁷: **A23C 9/12**
- (21) International Application Number:
PCT/US2003/014249
- (22) International Filing Date: 5 May 2003 (05.05.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
- | | | |
|------------|-------------------------------|----|
| 60/415,651 | 2 October 2002 (02.10.2002) | US |
| 60/420,354 | 22 October 2002 (22.10.2002) | US |
| 60/431,856 | 9 December 2002 (09.12.2002) | US |
| 60/433,704 | 16 December 2002 (16.12.2002) | US |
| 60/435,481 | 20 December 2002 (20.12.2002) | US |
| 60/446,436 | 2 February 2003 (02.02.2003) | US |
| 60/448,322 | 19 February 2003 (19.02.2003) | US |
- (71) Applicant (for all designated States except US): **DAIRY NUTRA, LLC** [US/US]; 330 SE Camino, Pullman, WA 99163 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **FLORIN-CHRISTENSEN, Jorge** [AR/US]; 1430 NE Upper Drive, Pullman, WA 99163 (US). **HARRIS, Joseph, B.** [US/US]; 330 SE Camino, Pullman, WA 99163 (US).
- (74) Agent: **ELIAS Lambiris**; Novozymes North America, Inc, 500 Fifth Ave, Suite 1600, New York, NY 10110 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: MILK IMPROVED BY TREATMENT WITH PROTEASES AND METHODS FOR ITS PREPARATION

(57) Abstract: In one aspect, the present invention provides methods for producing milk by limited proteolysis that is resistant to acid coagulation without negatively affecting the organoleptic properties of the milk. In another aspect, the invention provides methods for increasing the absorbability of calcium in milk to a desired level. In another aspect, the invention provides methods for increasing the viscosity of milk to a desired level. In a further aspect, the invention provides methods for producing acidified milk without coagulation. The methods of the invention comprise the steps of heating milk to a temperature between about 40 °C and about 90 °C and treating the milk with an effective amount of one or more protease. The invention also provides milk that is resistant to acid coagulation, milk with an increased level of calcium absorbability, milk with increased viscosity, stably acidified milk, and products made with the milks of the invention.

WO 2004/030463 A1